

UNDERHILL, VT TRAILS HANDBOOK

Underhill Trails Committee



**Adopted by the Underhill Selectboard as a Best Practice Manual on
September 22, 2009**

**UNDERHILL TRAILS COMMITTEE
SEPTEMBER, 2009**

**Brian Lyster, Chair
Dave Demarest
Nathan Guay
Patrick Lamphere
Chris Murphy**

**Carol Butler, Vice-Chair
Marcy Gibson
Shelby King
Karen McKnight
Mary Pacifici**

Tim Potvin

Town of Underhill, VT Trail Handbook

Introduction

Underhill has traditionally been a community that has been characterized as an active area for hiking, biking, horse-back riding, skiing, sledding, swimming, and other outdoor activities. In January, 2008 the Selectboard created a Trails Committee consisting of members of the public, the Planning Commission, the Conservation Commission, and the Recreation Committee to develop a policy for use of trails on Town-owned land and to develop a trail use model that could be used by residents and user-groups in their private establishment of new trails and maintenance of existing trails. The result of this is the "Underhill Trails Handbook", a guide to public and private property owners and user groups that suggests best practices and gives information about the development of a trail or the maintenance of an existing trail.

This document is the product of over a years worth of investigation by the Committee into how a trail could be developed or maintained while being respectful of the natural environment and the private property rights of landowners. In developing the Handbook, the committee met with representatives from successful trail organizations¹ and read several guides for trail building and maintenance to get ideas on the best practices for siting, design, crossing structures and maintenance practices. The Handbook sites these references throughout, and the Committee strongly encourages private land owners and user groups to go to the source material for detailed instructions in each area.

Outdoor recreation provides great exercise in a natural setting. However, trail users and landowners should be cognizant of the effect of trail use on the natural environment: from the soils and tree roots underfoot to the fragile vegetation and special habitats that exist along the trail route to the wildlife that lives there. Users also need to recognize the importance of the landowner's wishes with regard to trail use on private property. A good trail conserves the total trail environment, actively respects a landowner's property rights, and provides a fun and healthy recreational opportunity for users.

The Underhill Trails Committee hopes that this Handbook will prove to be a useful guide to the Town when developing trails on town-owned land, as well as for private landowners and user groups when developing trails on privately-owned land. It should be emphasized that this Handbook does not create any new regulations: it is merely a compilation of best practices and suggestions to guide the development and maintenance of new and existing trails in Underhill.

¹ The Committee would like to extend its thanks to Rolf Anderson President of the Hazen's Notch Association; Rick Sokolov of the Stowe Mountain Bike Club; and Jim Fredericks, Executive Director of the Catamount Trail Association for meeting with the Committee and sharing with them their collective experience and advice on the right and the wrong things to do when establishing a trail system.

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1 **CHAPTER 1: TRAIL STEWARDS AND PROPOSED TRAIL NOTEBOOK**

2 Section 1.1 Trail Stewards

3 To begin with, trail users and landowners should become acquainted with the term "trail
4 steward". As used herein, a trail steward is that individual or body that is responsible for
5 landowner contacts; addressing landowner concerns; securing permissions from
6 landowners; designing/maintaining the trail in such a way that the natural environment is
7 protected; securing all required permits; performing trail maintenance; and trouble
8 shooting any trail issues that may arise.

9
10 A trail steward could be the landowner, a user group, or an individual. However
11 stewardship is organized, the goal is to allay landowner concern about any trail issues and
12 to assure that trail use is not interfering with the goal of environmental protection of the
13 trail environment, which includes wildlife habitat in the trail corridor.

14
15 It should be recognized that some of the stewardship duties may be divided, for instance a
16 landowner may prefer to maintain the trail on their own land, but want a user group to
17 take care of other stewardship duties. There is no right or wrong way for trail
18 stewardship to function; what is important is that there is a trail steward for each trail if
19 the landowner's desire one.

20 Section 1.2 Trail Notebooks

21 A "trail notebook" is a compilation of the documents that a trail steward will amass when
22 talking with landowners about either creating a new trail or maintaining an old trail. The
23 trail notebook could be a loose leaf binder that can be easily added to as trail stewards'
24 progress in discussions with landowners. At first the notebook will be comprised of a
25 very short document that proposes a rough idea of a trail location, a trail name and
26 identifies the trail proposed trail stewards and what stewardship for this trail would mean.

27
28 As the steward and the landowner makes decisions about the details of trail uses, designs,
29 maintenance practices, and permits, those agreements should be memorialized on paper
30 and added to the notebook. The trail notebook will then become a working blueprint of
31 how the trail is to be used and maintained throughout the life of the trail. A copy of the
32 notebook should be distributed to all landowners and stewards so that everyone is in
33 agreement as to their respective trail responsibilities. Subsequent landowner contacts
34 should be recorded in the trail notebook and updated copies of the notebook should be
35 distributed annually. A sample Trail Document is found in Appendix D.

36
37 The documents for each trail shall vary depending on what type of agreement the
38 stewards and landowners reach. For example, is this for maintenance of an existing trail,
39 or is what is being proposed the development of a new trail? Wherever possible, the
40 Trails Committee has appended documents at the end of the Handbook to give you an
41 idea of the type of documents you may want to use. These document templates are meant
42 to give landowners and stewards an idea of how to start. The Committee urges
43 community members to amend these templates to suit the needs of each trail.

CHAPTER 2: LANDOWNERS

Section 2.1 Landowner as King/Queen

As noted in the introduction, a landowner's wishes about trail use on their property are of paramount importance and must be respected. Permission to use a trail, even one that has been in place for years, should be secured by every user or a user group or they run the risk of having the trail permanently closed. Trails that may have been constructed on land years ago by one landowner may not be owned today by the same landowner; or the trail location may not be acceptable to the landowner. Of course, it almost goes without saying that new trails should never be constructed on private land without landowner approval. Permission is discussed in more detail in section 2.10 below. Before that though, a landowner must know what he is giving permission for. Below are some of the topics to cover with a landowner when seeking permission to use their land.

Section 2.2 Landowner Representative

As part of trail stewardship, a trail steward should be assigned to each landowner as their representative. This will give a landowner a person who is personally responsible for meeting with them, answering their calls, and working on any concerns the landowner may have about trail use on his property. The representative should check in periodically with the landowner during the year to make sure that any concerns or issues that the landowner has are addressed. Landowners are encouraged to immediately notify their representative should a problem arise with trail usage or maintenance on their land. It is recommended that representatives respond to a landowner within 24 hours of receipt of a complaint.

Section 2.3 Landowner Liability

Often landowners are concerned about whether they can be held responsible for any injuries that occur on their land by a trail user. Vermont law, (12 VSA §§5791-5795) states that landowners who do not charge for access onto their land for recreational purposes shall not be liable for injury sustained by the user while on private land. The exception to this would be if the landowner causes injury as a result of "willful or wanton misconduct." Two classic examples of this would be if the landowner knew about a pit located on the property and did not flag it off, or if the landowner installed trip wires at knee height across a trail on his property. These would be examples of "willful or wanton" misconduct on the part of the property owner that could result in landowner liability. Simply being unaware of a natural hazard on a piece of property does not make a landowner liable under the statute.

It is recommended that a copy of the Vermont Agency of Natural Resources "Public Recreation on Private Land: A Landowner's Guide" be provided to each landowner

1 during the initial contact visit so that they are aware of what the law says in regards to
2 public use on their lands. This guide is available on-line² and at the Town Hall for
3 copying. In addition, a copy of the state statutes relevant to landowner liability is
4 available in this Handbook as Appendix B.
5

6 Section 2.4 Landowner Outreach

7
8 Landowners should be approached respectfully as you are asking to use a portion of their
9 land for recreational purposes. Before contacting landowners, it is recommended that a
10 little research is done to answer basic questions. A trip to the Town Hall and a
11 conversation with Town Hall staff will help determine who owns the land; if there is a
12 lease on the land that could affect use of the land; if there are any deeded trail easements
13 already on the land; how the land is currently used, including commercial/agricultural
14 uses; and if the landowner has expressed concerns in the past about trail usage.
15

16 Once initial research is done, a letter to the landowner outlining the broad concepts of the
17 proposed trail and asking if they would agree to meet with representatives from the trail
18 organization could be sent. A sample copy of this letter is included in this handbook as
19 Appendix A. If a trail user prefers a more informal approach, that is fine too; the point is
20 that landowners should be contacted before using their land.
21

22 Section 2.5 Landowner Meetings

23
24 The most important activity for trail groups at any landowner meeting is to listen to what
25 the landowner requires from the trail stewards in order to give permission for access onto
26 their land. If the trail already exists would the landowner prefer to have it moved to a
27 less intrusive location? What are the landowners concerns? What type of activities are
28 they willing to allow on their land? A discussion of landowner preferred trail uses can be
29 kick-started by using the sample "Landowner Preference Checklist" found in Appendix
30 C.
31

32 At the initial meeting, or at a follow up meeting, the user group should walk the land with
33 the landowner and review possible trail locations or if the trail already exists, possible
34 relocations. Inspect for: re-routing if desired by the landowner; fragile habitats that
35 should be avoided; and begin to identify trail maintenance requirements to avoid adverse
36 environmental impacts to the land. Ideally trail stewards will meet at least annually with
37 landowners to discuss any trail issues; to distribute updated information for the trail
38 notebook; and to give stewards an opportunity to thank landowners in person for the use
39 of their land.
40

² <http://www.vtfpr.org/pdf/pubrec.pdf>

1 Section 2.6 Allowed Uses/Hours of Operation/Seasons of Operation

2
3 Standards for allowed uses, hours of operations, and seasons of operation should be
4 established based upon landowner requests and recommended best practices from state
5 and local natural resource consultants. These standards are included in the "Landowner
6 Preference Checklist", Appendix C.

7
8 Section 2.7 Determining Trail Usage

9
10 Realistically, a trail may well consist of several different parcels owned by several
11 different landowners. If each landowner has a different set of trail requirements how do
12 you determine what the use on the trail will be? A recommended best practice to
13 determine a common trail use would be to have a meeting of all the trail landowners once
14 the landowners have been contacted and specifics about trail use have been discussed
15 individually with each landowner. This way you can get all the landowners together to
16 and reach accord on the trail use. A trail meeting with all the landowners also provides
17 the stewards with another opportunity to thank the landowners for their use and will build
18 community and communications among the trail landowners.

19
20 If a trail landowners meeting is not feasible, then the stewards should use a "least
21 common denominator" approach to trail usage. That is, only those trail uses that each
22 individual has identified as acceptable in common will be allowed. For example,
23 landowner A only wants walking, while landowner B is open to walking and skiing on
24 his portion of the trail. The allowed use for the trail would be walking, the trail use that
25 each landowner agrees upon.

26 Section 2.8 Signs

27
28 Signs are a good way to keep trail users on the designated trail, and could also point out
29 unique habitat features. However, as with all trail related activities, signs should only be
30 placed in accord with landowner wishes. Some landowners may prefer discreet signs to
31 encourage users to stay on the trail. Some may only want painted trail blazes in order to
32 minimize trail infrastructure on their land. Signs are discussed in more detail in §4.4.

33 Section 2.9 Permits

34
35 Permits for trail location and structures are the mechanisms that federal, state and local
36 governments use to assure compliance with environmental protection regulation. Trail
37 location and structures that do not have the required permits or are not allowed under the
38 law constitute violations to the landowner, not the trail organization. It is obvious that
39 the proper permitting procedures for trail location and structures must be complied with
40 to avoid any landowner liability for land use violations. The trail organization that
41 undertakes stewardship of a trail should offer to be responsible for paperwork and paying
42 for any required trail-related permits. In most instances, the landowner will have to be

the permit applicant. Potential required permits are discussed in greater detail in Chapter 5.

Section 2.10 Trail Maintenance

How the trail shall be maintained, what the limits of maintenance will be, and who will perform trail maintenance are all topics that should be discussed with the landowner. Consent of the landowner about maintenance practices is part of the package of landowner permissions. For more details on maintenance and recommended maintenance practices, see Chapter 6.

Section 2.11 Landowner Permission

After discussions with the landowner and agreement as to trail use, location, design, and maintenance, a landowner will hopefully agree to allow a trail on their land or continued use of an existing trail. A landowner may give verbal or written permission for trail use, with the understanding that this permission may be rescinded at any time if the landowner is unhappy with trail activities. A sample Landowner Permission Form is in Appendix D.

Annual Permission: One of the best practices is to agree to have landowner permission reviewed and renewed annually. This will give landowners an opportunity to discuss with their representative any concerns that may have arisen over the previous year. You will notice on the sample form that there is space for the landowner and stewards to list any conditions that apply to the trail use on their land. This includes agreed upon structures, maintenance practices, responsibility for obtaining and complying with permits, allowed signs, and allowed uses. These conditions must be observed and enforced by the trail stewards to the best of their ability in order to insure that the trail stays open.

Special Events: Another consideration addressed in the permission form is whether a landowner's permission extends to special events that will result in a higher concentration of trail use for a short period of time. A "special event" is defined as one that results in a greater intensity of trail use for a short period (usually 1 day) of time. Examples of this could be a school outing or private user group event. A frank discussion with landowners as to their expectations in the beginning should fend off problems in the future with special event usage. A recommended best practice is to have a discussion with each landowner as to what kind of density would trigger the "special event" designation for them. Would a group of 10 or greater at any one time be considered a special event?

20 +?

The Trails Committee heard landowner complaints about special event usage during the course of their research. As a result, the permission form includes two checkboxes: one that gives blanket permission for special event use in addition to day-to-day use or a box that requires separate permission for special event use. While the trail stewards may not be aware of each and every special event, they do have the responsibility to educate trail

1 users to any special requirements and to make sure that if they are aware of a special
2 event that permission has been secured if required by the landowner.

3
4 Easements: Annual written or verbal agreements can be rescinded at any time and as
5 such do not make for a secure trail. Permanent easements are the only way to guarantee
6 that the trail once agreed upon will remain in place. Some landowners may not be averse
7 to granting a permanent easement on their land for trail use. A trail easement should be
8 drafted by an attorney and once signed recorded in the land records. Some landowners
9 may require payment for the trail easement. Stewards should look to grant programs and
10 fundraising to secure money for the purchase of easements.

11 12 Section 2.12 Landowner Appreciation

13
14 As cited in § 2.5 above, meeting annually with landowners is a minimum best practice on
15 the part of trail stewards. Even better practice is to have an event each year that gives the
16 trail stewards and users an opportunity to thank the landowners, or to send them some
17 sort of thank you for the continued use of their land. We have heard of annual picnics;
18 the free distribution of a trail fund-raising calendar to landowners; and service days for
19 landowners where trail users help with projects for the landowner. Landowner
20 appreciation can be shown many ways, we encourage stewards to be creative. This to the
21 Trails Committee sounds like a great way to build trail community and have fun while
22 you're doing it.

CHAPTER 3: SUSTAINABLE TRAIL DESIGN

So you have met with the landowners and secured at least provisional approval to go ahead with designing a trail. The goal of good trail design is to produce a sustainable trail: one that is dry, easily maintained, and appropriate for the use it will receive. A sustainable design also means that the proposed construction techniques and materials will be available in the future should part of the trail need to be replaced; that materials used can be recycled; and considers whether recycled materials are appropriate for construction.³ Wherever possible, trail treads should be constructed with natural materials; drainage structures should be the least invasive of the natural area to achieve the desired drying; and crossing structures should be the minimum required to achieve trail continuity over fragile areas. First, some trail basics:

Section 3.1 Three Basic Components of a Trail Corridor

There are three basic components to a trail. They are:

1. Trail Tread: This is the surface of the trail that the user actually makes contact with while using the trail.
2. Trail Right-of-Way: This represents the cleared area around the treadway, including the width and height of clearing to accommodate the desired use.
3. Trail Buffer Zone: This is the area outside of the trail right-of-way that is used to buffer the impacts of: trail use from abutting neighbors; fragile natural habitat/resource areas; and to provide a more natural experience for trail users.⁴

Taken all together, the three trail components comprise the trail corridor.

Section 3.2 Trail Tread

A sustainable trail tread is one constructed of the correct natural materials. Ideal trail treads are constructed of a particle mixture of sand, clay and silt with a 20-50% gravel content. The seasonal depth to water table is 4 feet or more and slope⁵ is 0-5%. A trail tread that would require the most mitigation would be one with a high clay content with a seasonal high water table depth less than one foot and a slope greater than 20%. Soil types and depth to seasonal water table can be tested by digging small pits next to the

³ *Wetland Trail Design and Construction*, p 21 US Forest Service, University Press of the Pacific 2005.

⁴ *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, Chapter 2.

⁵ "Slope is the number of feet of vertical rise per 100 feet of horizontal distance; expressed as a percentage...a 10% slope rises 10 feet vertically for every 100 feet traversed horizontally." *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, pg 53.

proposed tread area.⁶ For trail treads that fall somewhere in between these two, varying degrees of mitigation and maintenance will be required to maintain the trail tread.

Section 3.3 Height and Width of Clearing

According to the Vermont Trails and Greenways Manual, the following general trail characteristics would be recommended for a trail for the following typical Underhill trail uses:⁷ Keep in mind these are suggested clearing limits; landowners and stewards can reach any accommodation they wish.

Trail Type	Recommended Tread Width	Cleared Width	Cleared Height	Recommended Maximum Grade	Surfaces	Bridges and Boardwalks
Hiking	18"-2'	3'-4'	8'	15% 25% for short stretches	Soil, stone	Rock crossings, timber, prefab bridges, or lumber boardwalks
Mt. Biking	18"-24"	2'-4'	8'	15%	Natural surface	Rock crossing or timber bridges
Horseback Riding	18"-30"	5'-6'	10'-12'	10%; 20% for less than 50 yds.	Natural surface	Flat, solid decking that doesn't bounce; min. 4' wide with strong high railings
X-Country Skiing	Varies, Depending on Terrain and Trail Design, Backcountry or Groomed ⁸	4'-6' Backcountry; 10'-12' Groomed ⁹	8' above average depth of snow	8%-25%	Snow	Min 8' wide and 4.5' railings

⁶ Id. A very useful chart entitled "Summary of Soil Indicators for Evaluation of A Proposed Trail Tread" is found on page 53 of the AMC Guide referenced here. Trail builders should refer to this chart for more details.

⁷ *Vermont Trails and Greenways Manual*, p 39 VT Trails and Greenway Council, 2007. Refer to this page for suggestions on trail characteristics for other types of uses.

⁸ The Trails Committee has amended the recommendation of the VT Trails and Greenways Manual here. The Manual recommends 8 feet.

⁹ The Trails Committee has amended the recommendation of the VT Trails and Greenways Manual here. The Manual recommends 4-6 feet.

1 Section 3.4 Contour Trails

2
3 When siting or re-locating trails, it is essential to walk the land multiple times to get the
4 best natural route for the trail. Contour trails are those that in general follow the contour
5 of the land. When designing a trail along the contour, grade reversals allow the trail to
6 shed water more easily. Grade reversals also create a more interesting and enjoyable
7 trail. While following the natural contours of the land, be sure that you avoid "fall line"
8 trails. These are trails that go straight up or down a hill. Water follows the path of least
9 resistance and will follow these trails, which in turn will cause erosion

10 Section 3.5 Abutting Landowners and Set-backs

11
12 In discussing trail design with landowners, the steward should also consider the concerns
13 of abutting property owners. Underhill zoning regulations require setbacks from abutting
14 property lines for structures. While it is not clear that a trail in and of itself would be
15 considered a "structure," following the minimum 20' set-backs from adjoining property
16 lines for structures is a recommended best practice. This best practice for set-backs could
17 also be improved by screening the trail from abutting properties by planting native plants.
18 While ultimately the final siting of the trail will be the landowner's decision, if the
19 stewards can anticipate neighbor concerns and address them early on it may make things
20 easier for the landowner in the future and provide for a more secure trail site.

21 Section 3.6 Wildlife and Plant Habitat

22
23 Landowners and trail stewards should consult with the state wildlife biologist and the
24 Underhill Conservation Commission to determine if a proposed or existing trail has any
25 negative impacts on plant and wildlife habitat. Impacts on plant and wildlife should be
26 minimized. *See* § 3.8, 5.1, 5.2, & 5.3. For areas that are prone to wildlife interaction, a
27 best practice is to design the trail with few sharp curves and maintain a sight distance of
28 75' to 100' so that users and animals will have some reaction time should they encounter
29 one another.¹⁰ Scenic views and points of interest are also important considerations for
30 trail designers. When walking the existing or proposed trail
31 designers/stewards/landowners should be aware of interesting wildlife, plants, or views
32 that the designers may want to accommodate or identify for trail users.

33 Section 3.8 Riparian Buffer

34
35 Riparian buffers are vegetated areas next to water resources that protect water resources
36 from nonpoint source pollution and provide bank stabilization and [protection for]
37 aquatic and wildlife habitat.¹¹

¹⁰ *Wetland Trail Design and Construction*, p 12 US Forest Service, University Press of the Pacific 2005.

¹¹ University of North Carolina, <http://www.soil.ncsu.edu/publications/BMPs/buffers.html>
Another, more precise definition provided by the Agency of Natural Resources, State of Vermont is: " The
width of land adjacent to lakes or streams between the top of bank or top of slope or mean water level and
the edge of other land uses. Riparian buffer zones are typically undisturbed areas consisting of trees,

1
2 Best Practice: Trails should be sited whenever possible with at least a 100' riparian
3 buffer of natural vegetation from streams. Stewards should discuss with landowners the
4 possibility of relocating existing trails and restoring riparian buffers with native plants. It
5 is highly recommended that any steward consult with the Underhill Conservation
6 Commission on appropriate riparian buffer plants to use when restoring riparian buffers
7 with native species.

8
9 According to the VT Greenways Manual, if possible, the very best practice around
10 streams is to maintain a riparian buffer of 330'. "This buffer will protect nearly all the
11 valuable functions in a riparian habitat, including high-quality cover for many wildlife
12 species." ¹² When constructing near streams, VT Greenways recommends giving trail
13 users access to a stream early on and then periodically throughout the length of the trail to
14 discourage random incursions into the buffer zone. For access areas, the
15 recommendation is to use large rocks to armor the streambank to prevent erosion.

16
17 Wetlands will also benefit from riparian buffers. Wetlands serve as critical habitat areas
18 for wildlife and plants; allowing the buffer from the trail will protect them from intrusion.
19 Scenic pull-offs for wildlife viewing can be incorporated into the trail design to allow
20 users the opportunity to observe the wetlands in certain areas while leaving the rest of the
21 wetland undisturbed.

22 23 Section 3.9 Permit Note

24
25 Underhill zoning regulations require a permit from the Zoning Administrator when
26 working within 100' of a streambank or watercourse (this includes a wetland). To obtain
27 the permit, the stewards shall have to provide plans that show that the proposed work
28 will: not affect the water table or natural water flow patterns; cause erosion due to
29 removal of vegetative cover; or increase the possibility of flooding. Certain structures
30 within a streambank will also require a design review and site review by the state stream
31 alterations permit specialist. Should a streambank or wetland also be part of a federally-
32 mapped floodplain, review by the state floodplain coordinator will also be required. This
33 is coordinated through the Underhill Zoning Administrator.¹³ For more on permitting,
34 see Chapter 5.

shrubs, groundcover plants, duff layer, and a naturally vegetated uneven ground surface, that protects the waterbody and adjacent riparian corridor ecosystem from the impact of these land uses." State of Vermont Agency of Natural Resources "Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers" adopted 12/9/2005.

¹² Id p 54.

¹³ Stream Alterations Specialist: Chris Brunelle, 879-5631.

Julie Foley, Wetlands Ecologist: 879-5650, (802) 527-5732, Julie.foley@state.vt.us

For advice as to wildlife impacts, contact Wildlife Biologist Jens Hilke: (802) 476-0126, jens.hilke@state.vt.us.

For Underhill Zoning and floodplain information and review, contact the Underhill Zoning Administrator, Kari Papelbon, 899-4434 x 106; underhillzoning@comcast.net

CHAPTER 4: SUSTAINABLE STRUCTURES

Section 4.1 Hardening the Trail Tread

When trails become slippery or muddy, users will oftentimes walk around that area creating "a vicious cycle of soil breakdown and trail widening."¹⁴ This is evidence of a trail that is not environmentally sustainable and in need of some trail hardening techniques. First, the trail should be examined as to location and slope and to determine if there is a better place or way to re-route the trail. If not then some structural assistance may be required. Examples of some of the drainage and crossing structures referenced here are depicted in Appendix E of this Handbook.¹⁵

Section 4.2 Drainage Structures¹⁶

There are two types of structures that could be constructed on a trail to protect the environment. They are drainage structures to remove water from the trail tread and thus reduce erosion of the tread; and crossing structures where there is either a wetland or a stream that require some type of bridge so as not to impact the natural landscape. In both instances, the appropriate structure will be determined by site conditions. Structures will be described below in a hierarchical fashion, starting with the least complicated and progressing on to the most complicated. The best practice here is to use the structure lowest in the hierarchy that adequately protects the environment in a sustainable manner. Drainage is a very important thing to consider.

A trail that does not shed water is not sustainable or enjoyable. One step to take to ensure proper drainage is to avoid low lying areas. If not possible, "armor" the low lying areas with rocks or build appropriate crossing structures. All drainage structures should be located near the top of a slope where erosion is occurring.

Drainage Ditches: According to the AMC, a proper drainage ditch should be 12"-18" wide at the bottom and 6"-8" deep. Ditch sides should slope gently out to avoid material from filling the ditch which can happen if the ditch sides are too steep.¹⁷

Drainage Dips: Drainage dips are basically earthen berms that are built into the downslope side of a cross-trail drainage ditch where the grade is 5% or less. A ditch is dug across the trail at a sharp angle, (45°-50°) so that water flow is slowed to reduce erosion of the earthen mound. On the down-slope side of the ditch, make a berm 1'-2'

¹⁴ See *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, 144.

¹⁵ Special thanks to the US Forest Service for granting permission to reprint their figures from *Wetland Trail Design and Construction*.

¹⁶ For complete instructions it is recommended that Chapter 7 of AMC's *The Complete Guide to Trail Building and Maintenance* be reviewed.

¹⁷ Id at 68.

thick and 1'-2' high. For extra strength, rocks can be used at the foundation of the mound. Water is diverted off the trail by the dip and into an outflow ditch that gradually broadcasts the diverted water onto the downslope trail right of way and trail buffer.¹⁸

Rock or Wood Water Bars: Water should be redirected without its flow being changed dramatically to avoid sedimentation and eventual clogging of the water bar and outflow ditch. To construct a water bar, a trench is dug that extends off both sides of the treadway. The angle of the trench should be 30°-50° to the treadway. The trench should be deep enough that the water bar material will be flush with the downslope side once in place.

For stone water bars, the stones should be placed in the trench with the flat surface towards the uphill side of the ditch and slightly overlapped so that water does not leak between them. For wood water bars, peeled rot resistant wood such as spruce, fir or hemlock logs may be used. Set the logs to impede people or water from going around them. Large rocks ("pin rocks") are put on each end of the log to hold it in place.

Once the stone or logs are in place, dig a ditch upslope of the water bar that extends across the treadway to catch all the runoff. "Four feet uphill from the bar gradually slope the ditch to the middle of the rock or log, leaving half the rock or log buried below the bottom of the ditch."¹⁹ Next, backfill the water bar by packing soil against the downhill side using the excavated ditch material and construct the outflow ditch off the lower end of the water bar to broadcast the diverted water to the trail right of way and buffer.²⁰

Section 4.3 Crossing Structures²¹

Stepping Stones: For shallow streams or boggy areas, stepping stones are the first choice for crossing structures. The stone surface should be flat and the stone thick enough to stay above the water or mud. Larger rocks are preferable as they will be less likely to move. Stepping stones may not be appropriate if the streambank will be eroded by certain uses such as horseback riding and bikes.²²

Rock Treadway: Using stepping stones in a tight pattern, rock treadways are created where stepping stones do not provide enough environmental protection. A rock box is a

¹⁸ See *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, 127; *Wetland Trail Design and Construction*, US Forest Service, University Press of the Pacific 2005 pg 25.

¹⁹ Id 26.

²⁰ Id 119-126.

²¹ For complete instructions, see *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, Chapter 7; and *Wetland Trail Design and Construction*, US Forest Service, University Press of the Pacific 2005 pg 21-41.

²² *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury, Appalachian Mountain Club Books 1998, 146.

1 frame constructed of peeled rot resistant logs spiked together to form a box. The box is
2 buried halfway into the ground and filled tightly with stepping stones, or stones that are a
3 little smaller.²³

4 Turnpike: Used to elevate the trail above wet areas, turnpikes work best when installed
5 in areas with a 0-20% sideslope. Ditches are excavated on either side of the treadway
6 and geotextile material is placed first in the treadway and under the retainer rocks or logs
7 on the side of the treadway. Retainer logs should be rot-resistant and at least 6 inches in
8 diameter. Then the treadway is topped with high quality fill so that the fill crowns in the
9 center of the treadway and slopes out to the top of the retainer material. The crown of the
10 filled trail tread should be a minimum of 2 inches or 2% grade above the retainer.²⁴

11 Preservative Treated Puncheon: A puncheon is the next level of crossing structure in that
12 it rests on preservative treated log sleepers. The puncheon is a short-span crossing
13 bridge that consists of a treated base lumber (the "sleepers"); stringers are attached at 90°
14 angles to the sleepers; and treads are nailed perpendicularly across the stringers to create
15 the treadway. The sleepers can be 6x6 or 8x8 inch square timbers. Stringers are
16 attached to the sleepers with bolts or nails. Size of the stringers is determined by the type
17 of traffic the trail will have: foot traffic requires less size than equestrian traffic. Best
18 sustainable practice is to attach a nailer to the sides of the stringers and nail the tread to
19 the nailer. This way, when the treads need to be replaced, the stringers will not be
20 compromised by repeated replacement of the treads; instead the nailers will simply be
21 replaced as necessary.²⁵ For pressure treated lumber used in a wet area, the
22 recommendations of the Western Wood Preservers Institute of AWPAs Use Category
23 UC4A should be followed.²⁶

24 Gadbury: A gadbury is a structure using 2 half logs for a treadway attached to a notched
25 sleeper. It generally requires more wood than a puncheon and requires more skill to make
26 and maintain. It is not considered as sustainable as the bog bridge.²⁷

27 Bog Bridges: A bog bridge consists of sleepers topped by planks. The sleeper is placed
28 in a shallow trench at right angles to the trail centerline. Another sleeper is placed in
29 another ditch located at right angles to the trail centerline approximately 6'-9' away from
30 the first ditch. This is continued until the desired span is reached. The sleepers are
31 notched wide enough to hold the plank that will be the treadway. Planks are put in place,

²³ Id.

²⁴ *Wetland Trail Design and Construction*, US Forest Service, University Press of the Pacific 2005 pg 22-24.

²⁵ Id at 36-38

²⁶ *Guide to Pressure Treated Wood Characteristics, Use, Specifications* Western Wood Preservers Institute. Document is on file at the Underhill Town Hall in the Trails Committee file for review.

²⁷ *Wetland Trail Design and Construction*, US Forest Service, University Press of the Pacific 2005 pg. 38.

1 sawed to length, and nailed to the sleeper. If the area to be crossed is particularly wet, the
2 sleepers may be set on stone footings and streambanks may be armored with rock.²⁸

3 Section 4.4 Signs

4 While perhaps not recognized as such, a sign is another trail structure that may or may
5 not require permitting and can take on various forms. Best practice as always is to
6 consult with the landowner for the type of signs they will allow.

7
8 Trail Signs: The trail should be clearly marked by the use of signs and/or trail blazes per
9 the landowner's wish. The more clearly a trail is signed the less chance that users will
10 wander from the trail. Where the trail intersects with a private trail or a protected natural
11 area on land that is not part of the designated trail, it is a recommended best practice that
12 a small sign shall be posted that reads, "The area beyond this sign is (private property/a
13 protected natural area). Please stay on the designated trail."²⁹

14
15 It is also a recommended best practice to design signs using a vertical format/or a single
16 wide post to minimize beaver and moose damage.³⁰ Signs can also be used to point out
17 unique natural features along the trail if that is desired by the trail stewards and approved
18 by the landowner.

19
20 Theft Prevention: Some trail signs may be irresistible to vandals. To discourage theft
21 and/or vandalism a best practice recommendation is to use stainless steel wood screws
22 that either requires an Allen wrench or other type of special screwdriver for removal.³¹

23
24 Trail Blazes: Not all landowners may wish to have signs on their land or feel that signs
25 may not be in keeping with the primitive nature of a proposed trail. In these instances
26 trail blazes may be used. Trail blazes may consist of a specified color painted on a tree or
27 small colored medallions either attached to a tree or affixed to a post.

28
29 Informational Kiosk: Informational kiosks near each parking area that depicts the trail
30 and natural features that can be seen while on the trail are structures that should be
31 considered by trail stewards. According to the AMC, a best practice for keeping trail
32 usage local is to site the kiosk not at the parking area but about 50'-100' in on the trail.
33 Again, having a kiosk would require landowner permission and the information contained
34 therein can vary greatly.

35

²⁸ Id at 39-40.

²⁹ Credit to the Hazen's Notch Association for the wording of this sign.

³⁰ See *Wetland Trail Design and Construction*, pp12-13, U.S. Forest Service Federal Highway
Administration 2005 on file at the Underhill Town Hall.

³¹ *Wetland Trail Design and Construction*, US Forest Service, University Press of the Pacific 2005 pg. 52.

1 For instance, the kiosk could have a statement that the designated trail consists of private
2 and/or public lands; that trail users must stay on the trail so as not to lose the use of the
3 private lands or disturb protected natural areas on public lands. Another suggested piece
4 of information for a kiosk is to include hunting information. Natural features information
5 can also be included and it may be desirable to have that information portable for trail
6 users to reference while on the trail. The Underhill Conservation Commission should be
7 consulted when compiling this information for any trails in Underhill.

8 Section 4.5 Parking Areas

9
10 Off-road parking for trail access should be sufficient so that cars are not parking in a
11 public or private right-of-way. This is a safety concern: when residents and emergency
12 vehicles cannot access residences, the potential for serious problems arise. Trail stewards
13 may want to consider towing as an option to remove vehicles from rights of way and
14 should discuss this option with landowners after making sure that this is a legal option.
15 Trail designers should bear in mind that the potential for greater density of trail use at any
16 one times increases as the size and accessibility of the parking area increases.³²

17
18 Parking areas must be identified and approval of a curb cut by the Underhill Selectboard
19 must be obtained if accessing off of a Town road. See § 5.4. All parking areas require
20 landowner approval. If the access is off a private road or driveway, trail stewards should
21 consult with landowners and affected neighbors for permission and to ascertain that there
22 are no private covenants restricting such use. Finally, a best practice for stewards would
23 be to patrol the trail access area from time to time and place windshield reminders not to
24 park in the right-of-way.
25

³² See *The Complete Guide to Trail Building and Maintenance 3rd ed*; Demrow & Salisbury, Appalachian Mountain Club Books 1998, pg 42.

CHAPTER 5: PERMITTING

Section 5.1 Why Get a Permit?

As noted earlier, obtaining the required federal, state, and/or local permit is not meant to make the trail design process more complicated or to insert "big brother" into things. Instead, getting the proper permits is the steward's guarantee to landowners and all trail users that they have developed a trail that complies with environmental protection and land use regulations. This is what brings the trail into synch with the underlying conservation ethic of environmental protection that was discussed in the introduction.

Now is a good time to reiterate that the permittee is generally the landowner, so trail stewards must work with landowners to secure all the proper permits for the trail. Failure to get a permit or to comply with the permit conditions constitutes a land use violation for the landowner, not a user group or steward. A best practice is for stewards to offer to pay for all permits, to fill out all the required paperwork, and after issuance of the permit to make sure as part of their stewardship that all permit conditions, if any, are complied with.

Stewards should be aware that permitting may take extra time depending on who you need to apply to. This time can be considerably reduced if stewards are aware of permit application requirements and submit complete permit applications the first time through. It is recommended that trail stewards talk to the Underhill Zoning Administrator before starting any kind of work on a trail. She can direct you as to: what permits, if any, you will need; give you contact information for the correct agency if necessary; help you understand permit requirements; and help you with your permit. Below is an outline of some permits that may be required in addition to the streambank development permits noted in § 3.9.

Section 5.2 Federal Permits

Even if federal funds are not being used for a trail, ethics suggests that the stewards voluntarily comply with the intent of the National Environmental Policy Act (NEPA), which requires a consideration of the potential adverse effects the trail may have on the environment, and also the Endangered Species Act which protects rare, threatened and endangered plants and animals. The stewards should consult with the Underhill Conservation Commission as to potential adverse environmental impacts. If the trail encroaches on waterways regulated by the Army Corps of Engineers, then a permit from the Corps may be required.

Section 5.3 State Permits

State permits may be required depending on the type of trail use and where it is located. Potential state permits are: a stream alterations permit for any stream crossings; a wetlands permit if any activity occurs within a class II wetland; and if any structures are

1 to be placed in a floodplain, a site plan review and recommendations by the state
2 floodplain coordinator. After a discussion with the Underhill Zoning Administrator, the
3 stewards should contact the appropriate state agency for permitting requirements as
4 directed by the Administrator. The stewards should also consult with state biologists and
5 the Underhill Conservation Commission if there are concerns with plant or wildlife trail
6 impacts.

7
8 Section 5.4 Local Permits
9

10 Under current Underhill Zoning Regulations, many structures require a permit from the
11 Zoning Administrator. Any structures put in place without the proper permitting
12 constitutes a local zoning violation for the landowner. Impacts to Class III wetlands are
13 also regulated by the Town Zoning office. In addition, parking area access off a Town
14 Road will require an access permit from the Underhill Selectboard. To determine if a
15 proposed trail or structure requires a permit, the Underhill Zoning Administrator should
16 be contacted for a review and opinion as to the permitting requirements, and if required, a
17 permit obtained by the stewards.
18

Section 5.5 Permit Chart

Below is a Chart of some of the permits that may be required. This chart is only meant to provide a thumbnail sketch of potential projects and permits that may be required.

Before beginning any work on a trail, contact the Underhill Zoning Administrator for a project review.³³

PROJECT DESCRIPTION	TYPE OF PERMIT THAT MAY BE REQUIRED
Trail Creation/Maintenance w/ Federal Funds	NEPA/Endangered Species Act Compliance
Construction/Maintenance near Army Corps of Engineers-Regulated Waters	Corps Permit/Permission
Stream Crossing	Corps Permit/State Stream Alterations Permit/Town Streambank Development Permit
Construction/Maintenance of Trail or Infrastructure w/in Wetland Buffer	Corps Permit/State Conditional Use Determination/Town Streambank Development Permit
Construction/Maintenance of Trail or Infrastructure in Floodplain	Review by State Floodplain Coordinator/Conditional Use Review by Underhill Development Review Board
Creation/Maintenance of Trail Infrastructure	Town Building Permit
Trail Near Mapped Deer Yard	Review by VT Fish and Wildlife
Access to Parking Areas off Town Road	Curb Cut Permit from Underhill Selectboard

³³ 899-4434 x 106.

CHAPTER 6: TRAIL MAINTENANCE³⁴

Every trail will need periodic maintenance no matter how sustainable your design is. Maintenance activities can be summed into four categories: clearing drainage; clearing blow-downs; brushing; and blazing or marking.³⁵

Clearing Drainage: Of all the maintenance activities the most important one to perform to achieve the conservation goal of trail tread preservation is to maintain the trail drainage systems. Drainage ditches and outflow ditches can get clogged by debris picked up when water carries it into the ditch. Simply removing the debris is not adequate maintenance. The ditch should be inspected for proper design and debris should be moved down slope and far enough away from the trail as to avoid being washed back into the ditch. If wood water bars have been used they should be inspected and replaced as necessary.

According to the AMC, a proper drainage ditch should be 12"-18" wide at the bottom and 6"-8" deep. Ditch sides should slope gently out to avoid material from filling the ditch which can happen if the ditch sides are too steep.³⁶

Clearing Blow-Downs: Clearing blow-downs is a fairly typical year round maintenance activity for Underhill given the strength of the winds in Town. AMC recommends using an axe for trail clearing, although often in Underhill chain saws can be an easier tool depending how far along the trail you have to carry it. As always, safety procedures should be reviewed with volunteers before any trail clearing takes place and safety practices including using proper safety equipment should be observed at all times. Debris from the blow-down should again be moved downslope and far enough away so it does not interfere with trail drainage systems.

Brushing: Brushing is pretty much what it sounds like: keeping the brush cleared from the trail right-of-way. Without annual brushing, even a well-used trail can become grown in and make passage less pleasurable. The agreed upon limits of disturbance for trail width and height shall be observed when brushing.

Blazing or Marking: Painted blazes will need to be freshened up and other trail markers, including all signs should be inspected annually for vandalism, animal damage, and general fading. Any issues should be addressed by the trail stewards.

³⁴ In general, see *The Complete Guide to Trail Building and Maintenance 3rd ed*; Demrow & Salisbury, Appalachian Mountain Club Books 1998, Chapters 5 and 7 for greater trail maintenance details.

³⁵ Id at 65.

³⁶ Id at 68.

CONCLUSION

Sustainable Trails and the Trail Notebook

As you can see, there are many decisions that must be made when in the process of designing and maintaining a new trail or maintaining an existing trail. To make the trail notebook an active reflection of those decisions, the trail stewards should update the notebook to include those decisions as they are made. In the end, you will have a reference guide for your trail that includes: trail design basics such as the type of trail use and the width and height limits of clearing on the trail; conditions for landowner approval; a description of what types of trail structures will be used where; a copy of the permits for those structures if necessary; any accommodations for fragile habitat areas; what signage, if any will be used; where the parking for the trail will be and permission for parking areas secured; and what, if any, mapping is going to be done on the trail.

If trail stewards and landowners follow the agreed upon trail guidelines as set forth in the trail notebook, then we may all look forward to years of trail enjoyment in Underhill.

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1 **APPENDIX B**

2 **Vermont Statutes: Exemptions from Landowner Liability**

3
4 Below are printed the relevant state statutes for protecting landowners from liability for
5 recreational use on their land.
6

7 **Title 12: Court Procedure**

8 **Chapter 203: Limitations On Landowner Liability**
9

10 **12 VSA § 5791: Purpose**

11 The purpose of this chapter is to encourage owners to make their land and water available
12 to the public for no consideration for recreational uses by clearly establishing a rule that
13 an owner shall have no greater duty of care to a person who, without consideration, enters
14 or goes upon the owner's land for a recreational use than the owner would have to a
15 trespasser. (Added 1997, No. 110 (Adj. Sess.), § 1.)
16

17 **12 VSA § 5792: Definitions**

18 As used in this chapter:

19 (1) "Consideration" means a price, fee or other charge paid to or received by the owner in
20 return for the permission to enter upon or to travel across the owner's land for recreational
21 use. Consideration shall not include:
22

23 (A) compensation paid to or a tax benefit received by the owner for granting a permanent
24 recreational use easement;
25

26 (B) payment or provision for compensation to be paid to the owner for damage caused by
27 recreational use; or
28

29 (C) contributions in services or other consideration paid to the owner to offset or insure
30 against damages sustained by an owner from the recreational use or to compensate the
31 owner for damages from recreational use.
32

33 (2)(A) "Land" means:

- 34 (i) open and undeveloped land, including paths and trails;
35 (ii) water, including springs, streams, rivers, ponds, lakes and other water courses;
36 (iii) fences; or
37 (iv) structures and fixtures used to enter or go upon land, including bridges and
38 walkways.
39

40 (B) "Land" does not include:

- 41 (i) areas developed for commercial recreational uses,
42 (ii) equipment, machinery or personal property, and
43 (iii) structures and fixtures not described in subdivision (2)(A)(iii) or (iv) of this
44 section.

(3) "Owner" means a person who owns, leases, licenses or otherwise controls ownership or use of land, and any employee or agent of that person.

(4) "Recreational use" means an activity undertaken for recreational, educational or conservation purposes, and includes hunting, fishing, trapping, guiding, camping, biking, in-line skating, jogging, skiing, swimming, diving, water sports, rock climbing, hang gliding, caving, boating, hiking, riding an animal or a vehicle, picking wild or cultivated plants, picnicking, gleaning, rock collecting, nature study, outdoor sports, visiting or enjoying archeological, scenic, natural, or scientific sites, or other similar activities. "Recreational use" also means any noncommercial activity undertaken without consideration to create, protect, preserve, rehabilitate or maintain the land for recreational uses. (Added 1997, No. 110 (Adj. Sess.), § 1.)

12 VSA § 5793. Liability limited

(a) Land. An owner shall not be liable for property damage or personal injury sustained by a person who, without consideration, enters or goes upon the owner's land for a recreational use unless the damage or injury is the result of the willful or wanton misconduct of the owner.

(b) Equipment, fixtures, machinery or personal property.

(1) Unless the damage or injury is the result of the willful or wanton misconduct of the owner, an owner shall not be liable for property damage or personal injury sustained by a person who, without consideration and without actual permission of the owner, enters or goes upon the owner's land for a recreational use and proceeds to enter upon or use:

(A) equipment, machinery or personal property; or

(B) structures or fixtures not described in subdivision 5792(2)(A)(iii) or (iv) of this title.

(2) Permission to enter or go upon an owner's land shall not, by itself, include permission to enter or go upon structures or to go upon or use equipment, fixtures, machinery or personal property. (Added 1997, No. 110 (Adj. Sess.), § 1.)

12 VSA § 5794. Landowner protection

(a) The fact that an owner has made land available without consideration for recreational uses shall not be construed to:

(1) limit the property rights of owners;

(2) limit the ability of an owner and a recreational user of the land to enter into agreements for the recreational use of the land to vary or supplement the duties and limitations created in this chapter;

(3) support or create any claim or right of eminent domain, adverse possession or other prescriptive right or easement or any other land use restriction;

(4) alter, modify or supersede the rights and responsibilities under chapters 191, animal control, and 193, domestic pet or wolf-hybrid control, of Title 20; under chapters 29, snowmobiles, and 31, all-terrain vehicles, of Title 23; under chapter 23, bicycle routes, of Title 19; and under chapter 20, Vermont trail system, of Title 10;

(5) extend any assurance that the land is safe for recreational uses or create any duty on an owner to inspect the land to discover dangerous conditions;

(6) relieve a person making recreational use of land from the obligation the person may have in the absence of this chapter to exercise due care for the person's own safety in the recreational use of the land.

(b) Nothing in this chapter shall create any presumption or inference of permission or consent to enter upon an owner's land for any purpose.

(c) For the purposes of protecting landowners who make land available for recreational use to members of the public for no consideration pursuant to this chapter, the presence of one or more of the following on land does not by itself preclude the land from being "open and undeveloped": posting of the land, fences, or agricultural or forestry related structures. (Added 1997, No. 110 (Adj. Sess.), § 1; No. 147 (Adj. Sess.), § 190a.)

12 VSA § 5795. Exceptions

This chapter shall not apply to lands owned by a municipality or the state. (Added 1997, No. 110 (Adj. Sess.), § 1.)

Title 10: Conservation and Development

Chapter 20: Vermont Trails System

10 VSA § 443. Vermont trails system

The Vermont trails system shall consist of those individual trails recognized by the agency of natural resources with the advice of the greenways council. The agency, with the advice of the council, shall establish criteria for recognition of single use and shared use trails. (Added 1993, No. 211 (Adj. Sess.), § 28.)

10 VSA § 448. Landowner liability

No public or private owner of land which is a part of the Vermont trails system shall be liable for any property damage or personal injury sustained by any person using these trails unless the public or private owner intentionally inflicts the damage or injury. (Added 1993, No. 211 (Adj. Sess.), § 28.)

APPENDIX C

Landowner Trail Use Permissions/Preferences Checklist

Date: _____

Property Owner: _____

Location of Property: _____

Trail Stewards: _____

Contact Information: Tel: _____ Email: _____

Mailing Address:

Please check the type of activity that would be permitted on your property and season(s) that you would approve of the activity taking place:

ACTIVITY	SPRING	SUMMER	FALL	WINTER
Walking				
Running				
Mountain Biking				
Cross-Country Skiing				
Snowshoeing				
Dirt Biking				
ATVs				
Snowmobiling				
4-Wheeling (SUVs)				
Horseback Riding				
Other Activities <i>Please Specify:</i>				

Special Event Usage:

☐ No Special event permission required

☐ Special event permission required

How many users would trigger the special event permission requirement? _____

Time of Day during which you approve usage of trails:

(Please enter times)

☐ No Restrictions ☐ Mornings _____

☐ Mid-Day _____ ☐ Evenings _____

☐ Nights _____

Dogs on Trails: ☐ No Restrictions ☐ Not Permitted

☐ With Leash Only ☐ Leash use near buildings or animals

Prohibited Activities: _____

Weather/Ground Cover Conditions:

☐ No Restrictions ☐ Not When Muddy

☐ Not when snow covered ☐ Only when snow covered

☐ Only when water ways are frozen

☐ Other: _____

Should activities be limited during hunting, fishing, or trapping seasons?

Hunting: ☐ Yes ☐ No

Fishing: ☐ Yes ☐ No

Trapping: ☐ Yes ☐ No

Do you have a "Safety Zone" posting on your land? ☐ Yes ☐ No

Is your land posted for hunting? ☐ Yes ☐ No

Will parking be allowed on your property? ☐ Yes ☐ No

Will you allow the trail on your property to be mapped? ☐ Yes ☐ No

Do you have any other preferences or concerns?

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APPENDIX D
Sample Trail Document

Trail Name: _____

Landowner Name: _____

Landowner Contact Information: _____

Trail Steward: _____

Personal Representative: _____

Representative Contact Information: _____

Date of Landowner Meeting(s): _____

Permitted Trail Uses: Attach Landowner Trail Use/Permission Checklist

Permit Required? ☐ Yes ☐ No

If "Yes" list permits and conditions if any:

- 1. _____
- 2. _____
- 3. _____

Trail Design/Infrastructure Agreements: Please check if discussed and attach sheets detailing agreements:

- | | | | |
|--------------------------------------|--|--|-------------------------------------|
| <input type="checkbox"/> Tread Width | <input type="checkbox"/> Cleared Width | <input type="checkbox"/> Cleared Height | <input type="checkbox"/> Max. Grade |
| <input type="checkbox"/> Surface | <input type="checkbox"/> Crossing Structures | <input type="checkbox"/> Drainage Structures | |
| <input type="checkbox"/> Signs | <input type="checkbox"/> Parking Areas | | |

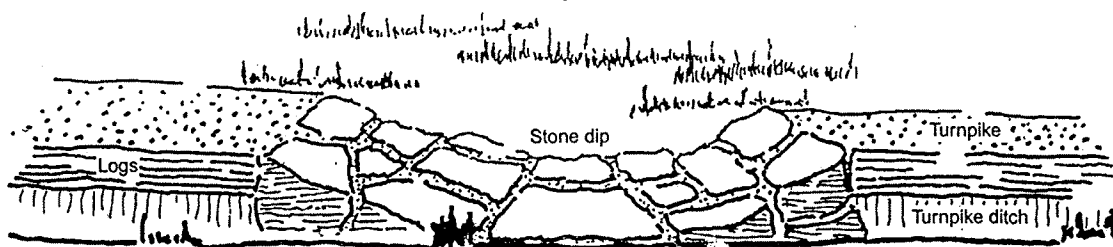
Maintenance Agreements: Please check if discussed and attach sheets detailing agreements:

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| <input type="checkbox"/> Clearing Drainage | <input type="checkbox"/> Clearing Blow-downs | <input type="checkbox"/> Brushing | <input type="checkbox"/> Blazing/Marking |
|--|--|-----------------------------------|--|

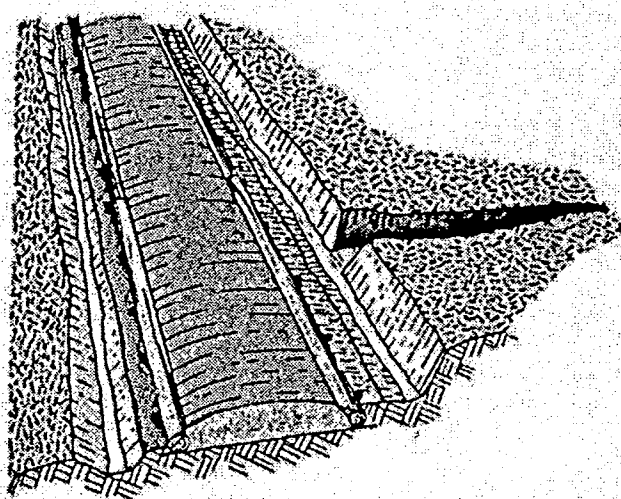
Appendix E

Drainage and Crossing Structures

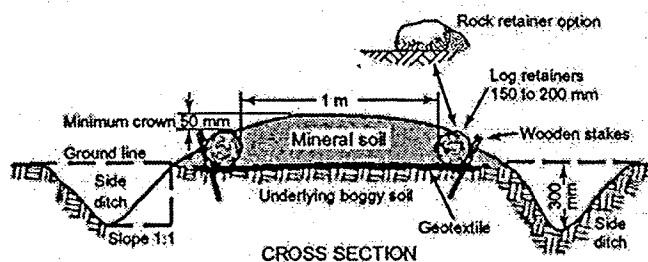
Dips



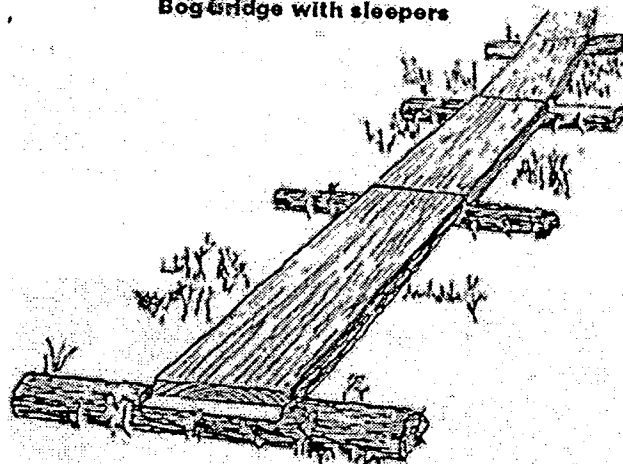
Turnpike



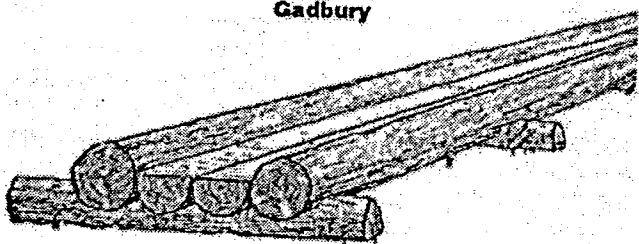
Geotextile Placement



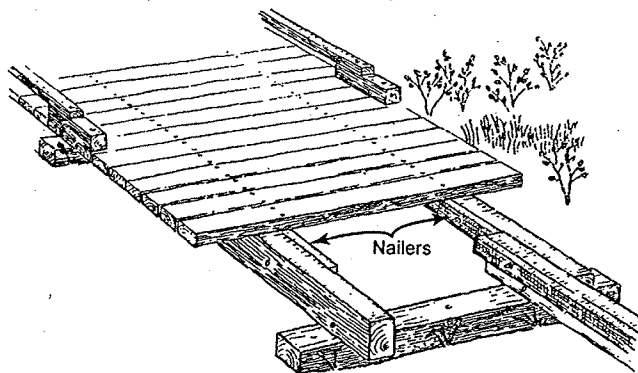
Bog bridge with sleepers



Gadbury



Preservative-treated puncheon



1 **APPENDIX F**

2 **References**

3
4 *The Complete Guide to Trail Building and Maintenance* 3rd ed; Demrow & Salisbury,
5 Appalachian Mountain Club Books 1998.

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7 *Wetland Trail Design and Construction*, US Forest Service, University Press of the
8 Pacific 2005.

9
10 *Vermont Trails and Greenways Manual*, VT Trails and Greenway Council, 2007

11
12 *Guide to Pressure Treated Wood Characteristics, Use, Specifications* Western Wood
13 *Preservers Institute*. Document is on file at the Underhill Town Hall in the Trails
14 Committee file for review.
15